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# The Effects of a Test-Taking Skills Intervention on Test Anxiety and Test Performance in 4th Graders

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THE EFFECTS OF A TEST-TAKING SKILLS INTERVENTION  
ON TEST ANXIETY AND TEST PERFORMANCE IN 4<sup>TH</sup> GRADERS

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
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in

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by  
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## TABLE OF CONTENTS

LIST OF TABLES .....	iii
ABSTRACT .....	iv
INTRODUCTION .....	1
Anxiety .....	1
Standardized Testing .....	2
Test Anxiety.....	4
Childrens’ Test Anxiety Measures.....	8
Test Anxiety Treatments .....	9
Test-Taking Skills Intervention .....	12
Purpose of the Study.....	13
METHOD .....	14
Participants.....	14
Experimental Design .....	15
Materials and Measures .....	15
Procedure .....	18
RESULTS.....	22
Analyses.....	22
DISCUSSION.....	26
Limitations .....	28
Future Directions.....	29
REFERENCES .....	30
APPENDIX A: INTERVENTION SESSION 1 – DESCRIBE .....	34
APPENDIX B: CONSENT FORM .....	41
APPENDIX C: INSTITUTIONAL REVIEW BOAD APPROVAL.....	44
VITA .....	45

## LIST OF TABLES

1.	Demographic Variables .....	14
2.	Children’s Test Anxiety Scale (CTAS) and Louisiana Educational Assessment Program (LEAP) Sample Test Scores .....	22

## **ABSTRACT**

Increases in standardized testing have been accompanied by increased reports of test anxiety in younger students. School-based test anxiety interventions can be implemented to decrease test anxiety and improve test performance. Skill-based interventions have effectively addressed both of these variables; however, the research has primarily targeted secondary and university students. The purpose of the current study was to determine if a test-taking skills intervention will decrease test anxiety and improve test performance in 4<sup>th</sup> grade students. Results indicated that the test-taking skills intervention resulted only in a minor decrease in test anxiety that maintained at 1-month follow-up. Effects on test performance were mixed immediately following the intervention, and test performance was equivalent to baseline levels at the conclusion of the study. Limitations of this study and recommendations for future research are included.

*Keywords:* test anxiety, test performance, test-taking skills, elementary

## INTRODUCTION

Test anxiety is a situation-specific anxiety generally characterized by maladaptive cognitions, physiological reactions, and behaviors, and has been reported across various student populations. With the increase in standardized testing at younger ages, test anxiety is likely to become more prevalent, particularly for elementary students (Hill & Wigfield, 1984; Wren & Benson, 2004). Increased demands on students and schools to meet academic standards emphasize the importance of treating students whose test anxiety can significantly affect academic and cognitive performance. Because standardized testing begins in elementary school, earlier treatment may provide students a greater opportunity for success.

### **Anxiety**

All children experience fluctuations in anxiety that are developmentally adaptive, but some children experience excessive, maladaptive anxiety that impairs functioning at home as well as school (Kazdin & Weisz, 1998; Kendall, 1993). Maladaptive anxiety can be characterized as an internalizing disorder. Internalizing disorders are those in which debilitating emotional problems are directed toward the self, such as withdrawal, depression, and, anxiety (Kazdin, 2003). Externalizing disorders are those in which observable problem behaviors are directed toward the environment, such as hyperactivity, aggression, or oppositional behaviors (Kazdin, 2003). Both classes of disorders can manifest during childhood, but externalizing disorders are more commonly referred. Internalizing disorders are more difficult to observe and tend to cause fewer classroom disturbances. As such, they often go unnoticed by teachers and other authority figures (Kazdin, 2003; Kazdin & Weisz, 1998).

Mild anxiety is a normal response to stressful situations, but anxiety becomes problematic when it is excessive and affects life satisfaction (Kendall, 1993; National Institute of

Mental Health [NIMH], 2013). Nearly 10% of children and 20% of adolescents meet criteria for the diagnosis of an anxiety disorder (Essau, Conradt, Sasagawa, & Ollendick, 2012; NIMH, 2013), and the number approaching criteria is likely larger. Treatment can lessen the severity of symptoms and teach appropriate coping skills, but despite advances in evidence-based interventions, few children receive these services. Because anxiety is an internalizing problem, it is more difficult to directly observe than externalizing problems and less likely to be referred. Despite this setback, the amount of time students spend at school makes it an opportune setting for screening and intervention.

School is an influential setting during child development in which students build foundations in academic learning and socialization. It is one of the most stressful environments for many children (Mychailyszyn, Mendez, & Kendall, 2010), and school stresses can further provoke anxiety. Identifying school related elements that contribute to anxiety could be beneficial as anxiety disorders are costly for schools and society, as well as students (Gallegos, Beretvas, Benavides, & Linan-Thompson, 2012). Considering the time spent in school and its significant effects on students' academic, behavioral, and social development, it is imperative that schools take advantage of their influence by providing prevention and intervention programs. Furthermore, students who receive evidence-based treatment in schools have shown reduced levels of anxiety compared to students who do not receive treatment (Ergene, 2003; Essau et al., 2012; Gallegos et al., 2012). Identifying the students, as well as predictors of anxiety in educational settings, is crucial for the advancement of school-based treatment.

### **Standardized Testing**

Over the past several decades, increases in standardized testing have been mandated in an effort to increase school accountability for student outcomes (Wren & Benson, 2004).

Standardized test results are used to measure individual academic achievement as well as school-wide performance (von der Embse, Barterian, & Segool, 2013). Their importance has been heightened by federal education reform that emphasizes using data-based decisions to increase accountability, develop curriculum, and improve academic performance. Implementation of the No Child Left Behind Act of 2001 (NCLB; 2002) mandated that 95% of students in grades 3-8 take part in annual state-wide assessment, as well as a minimum of one assessment in high school. It is likely that the increased pressure on schools and educators has concurrently resulted in increased pressure on students to perform.

Children first encounter standardized tests during the elementary years, with nearly all students participating by third grade. Standardized tests present students with different demands than routine classroom tests, such as unfamiliar information, different question formats, and strict time limitations (Hill & Wigfield, 1984). The unfamiliar testing situation alone may cause discomfort, particularly for younger students who are less experienced, but the added performance pressure may result in debilitating levels of anxiety.

According to Zeidner (1998), the amount of anxiety an individual experiences varies in relation to the qualities of the task (e.g. difficulty and time constraints of tests), as well as personal perceptions such as threat, fear, and coping ability. These experiences may be heightened during standardized assessments. In a recent study of third, fourth, and fifth graders, students reported experiencing significantly higher anxiety during standardized tests than class tests (Segool, Carlson, Goforth, von der Embse, & Barterian, 2013). Teachers also reported significant increases in anxiety during their students' standardized testing, which could indirectly increase the anxiety of the students (Doyal & Forsyth, 1973; as cited in Segool et al., 2013).

These findings accentuate the importance of providing students and educators with the tools to cope with anxiety, particularly before the onset of high stakes testing.

### **Test Anxiety**

Individuals who experience significant anxiety during evaluative situations, specifically tests, may be struggling with test anxiety. Test anxiety is defined as the phenomenological, physiological, and behavioral reactions that occur when an individual is distressed about the possible outcomes on a test or other evaluative situation (Sieber, O'Neil, & Tobias, 1977). Test anxiety may be characterized as *state anxiety*, an anxiety level that varies in relation to the perceived threat of a situation, as opposed to *trait anxiety*, an enduring individual proneness to anxiety across settings (Spielberger & Vagg, 1995). Test-anxious individuals are usually higher in trait anxiety and experience more profound state anxiety during tests; as such, test anxiety is generally regarded as a situation-specific anxiety trait (Spielberger, Gonzalez, Taylor, Algaze, & Anton, 1978; as cited in Spielberger & Vagg, 1995). These students usually experience anxiety in other contexts, but it is significantly heightened in evaluative testing situations.

Generally, test anxiety is characterized as a tridimensional construct including maladaptive cognitive, physiological, and behavioral responses (Kendall, 1993; Zeidner, 1998). This triad is reflected in the difficulties individuals report during testing situations. Students state they are often preoccupied with worries about work evaluation, expectations of failure, and feelings of threat, self-deprecation, and low self-efficacy (Ergene, 2003; I. Sarason, 1975; I. Sarason & Stoops, 1978). They report heightened fear of failure and criticism, worry, and social concerns, as well as depressive symptoms and hopelessness (King, Mietz, Tinney, & Ollendick, 1995). Furthermore, physiological responses (e.g. increased respiration, heart rate, blood sugar) as well as behavioral responses (e.g. avoidance, distraction) have been widely reported (Zeidner,

1998). Anxious responses are different for each individual, but it is clear that multiple effects are evident.

In the wake of increased emphasis on achievement testing outcomes, it is not likely that the prevalence of test anxiety will decrease without prevention or intervention practices. The prevalence of test anxiety in schools is high and will likely continue to rise with the pressure to improve standardized test scores. Hill and Wigfield (1984) estimate that two to three students in each classroom have high test anxiety, which roughly translates to about four to five million elementary and secondary school children. It is likely that many of these students perform poorly as a result of their test anxiety. Poor performance on classroom and standardized tests can result in academic difficulties.

Research has shown that the effects of test anxiety are widespread, particularly in regards to school difficulties. Students with high test anxiety often perform poorly in evaluative situations (Hill & Wigfield, 1984; Wine, 1971; Zeidner, 1998). These performance deficits may be reflected in measures such as classroom grades and tests, standardized tests, and retention rates. In a meta-analysis conducted by Hembree (1988), it was determined that test anxiety is negatively correlated with class grades across a range of subjects, especially for students in third grade and above (as cited in Zeidner, 1998). A study of fifth and sixth graders with high test anxiety found that these students perform worse in evaluative classroom settings (e.g. standardized tests) than their non-anxious counterparts (Zatz & Chassin, 1985). The performance deficits of test-anxious students may provide an invalid measure of achievement as test anxiety may confound their true performance ability.

While maladaptive thoughts can affect academic performance, performance, in turn, can also affect thoughts. When highly test-anxious students perform poorly, their self-deprecations

may be reinforced (von der Embse et al., 2013). This reinforcement can contribute to the cyclical nature of test anxiety. Continued failure to succeed could discourage test-anxious students and contribute to additional failures; thus, performance problems contribute to test anxiety, and vice versa (Wigfield & Eccles, 1989). Failure to succeed may lead students to avoid thinking about the test or put forth less effort because they are convinced their efforts are not sufficient.

Multiple theories of test anxiety have been proposed over the past several decades. Although it is likely that earlier work on test anxiety was conducted, the emergence of the research movement examining test anxiety is often attributed to Mandler and Sarason's research with Yale undergraduates. They proposed a drive theory postulating that students with high test anxiety have a higher anxiety drive during tests, which results in more task-irrelevant responses such as worries and physiological reactions (Mandler & S. Sarason, 1952; S. Sarason & Mandler, 1952). These task-irrelevant responses interfere with performance. They also found that evaluative instructions have opposite effects based on a student's level of test anxiety; highly test-anxious students perform more poorly and low test-anxious students perform better following evaluative instructions (Sarason, Mandler, & Craighill, 1952). Their results generated a multitude of related studies and are considered a groundbreaking step in test anxiety research.

Liebert and Morris (1967) expanded previous research through their conceptualization of two distinct components of test anxiety: worry and emotionality. Worry constitutes the cognitive concerns about performance outcomes (e.g. self-derogation, fear of failure), while emotionality is the perception of physiological arousal in response to evaluative situations (e.g. increased heart rate, perspiration). While the correlation between the two components is fairly high, they exhibit different effects. For example, Morris and Liebert (1969) found that worry and poor

academic performance were related, whereas emotionality and performance had little relation. This differentiation exposed the importance of cognitive factors on performance outcomes.

Cognitive-based test anxiety theories followed shortly after. Wine (1971) suggested that test anxiety can be understood as an attentional difference. Highly test-anxious students are focused internally on self-depreciative information while low test-anxious students focus more on task-relevant information. Worry causes the individual to focus on negative thoughts that distract from the task, and it is the worry component of Liebert and Morris's dualistic theory that results in performance deficits (Wine, 1971). Because attention is directed inward, students with high test anxiety do not adequately direct attention to the task at hand. The cognitive-attentional model can alternately be called the cognitive-interference model as it assumes that, although learning has occurred, the anxiety evoked by the testing situation interferes with the retrieval of information (Tobias, 1985; Zeidner, 1998). Performance can be improved if attention is dedicated to task-relevant information instead of self evaluation (Wine, 1971). It is this approach that led to the vast research on cognitive treatment of test anxiety with secondary and university students (Algaze, 1995; Zeidner, 1998).

Perhaps the most recent interpretation of test anxiety is the skills deficit theory. The deficit model assumes that: (a) deficient study skills cause poor acquisition of information, or (b) deficient test-taking skills cause an awareness of poor test performance (Tobias, 1985; Zeidner, 1998). Poor preparation or the perception of poor performance, respectively, may result in increased test anxiety. The skills-deficit theory characterizes test anxiety as an indirect effect of deficient study or test-taking skills (Kirkland & Hollandsworth, 1980; Zeidner, 1998), while poor performance appears to be a direct effect. Inadequate test-taking skills seem to contribute to

worry cognitions experienced during testing (Benjamin, McKeachie, Lin, & Holinger, 1981). As such, worries about the lack of adequate skills may lead to increased test anxiety.

### **Childrens' Test Anxiety Measures**

While various measures can be used to assess test anxiety, the most common method is the use of self-report questionnaires. The first operationally defined self-report measure for test anxiety was created in the 1950s, simply titled the Test Anxiety Questionnaire (TAQ; Sarason & Mandler, 1952; Sarason et al., 1952). Since the TAQ, a multitude of self-report measures have been made available for use (e.g. Test Anxiety Inventory, Reactions to Tests, Revised Test Anxiety Scale). However, the majority of these measures have been developed for adults or lack adequate psychometric evaluation with children (Wren & Benson, 2004; Wigfield & Eccles, 1989). Although some scales have been used with school-age populations, they may not provide adequate measures of test anxiety because they were created for adult use. It is necessary for children to be assessed using measures appropriate for their age.

One of the most widely used self-reports for children is the Test Anxiety Scale for Children (TASC; Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960; as cited in Wren & Benson, 2004). The TASC is a 30-item yes/no questionnaire that is read aloud to students and developed for children in first through sixth grades. It has been widely used for several decades, but attention has recently been drawn to its datedness. Wren and Benson (2004) have identified problems with the TASC, including difficult wording and outdated construct definition and dimensions. Therefore, the TASC no longer appears to be appropriate for use with today's students. More modern measures that account for the multidimensionality and cultural variability of test anxiety would be more appropriate.

The Children's Test Anxiety Scale (CTAS; Wren & Benson, 2004) is a 30-item questionnaire developed for use with students from third to sixth grades. Wren and Benson state that the majority of students begin to experience standardized testing in third grade, so it is important that a measure be available to identify test anxiety when it begins to manifest. Unlike the TASC, responses are based on a 4-point Likert scale, which enables more adequate ratings of the severity of each item. The CTAS is based on the tridimensional theory of test anxiety including thoughts, autonomic reactions, and off-task behaviors. This theoretical framework reflects a more modern view of the test anxiety construct. Based on the shortening of items, changes in response format, and revised theoretical domain, the CTAS appears to be a more up-to-date measure of test anxiety in children.

### **Test Anxiety Treatments**

Multiple test anxiety interventions have exhibited promising results; however, the bulk of the research has been conducted with college students and adults (Ergene, 2003; Gregor, 2005). In a meta-analysis of fifty-six studies, a comparison of treatment versus no treatment revealed that participants who complete test anxiety interventions appear to be better off than about 74% of those who remain untreated (Ergene, 2003). This rate of improvement should encourage the provision of treatment for younger ages because interventions for elementary students could prevent test anxiety or lessen the need for more intensive resources at a later age.

Most of the early intervention research relied heavily on behavioral techniques, and they continue to be used frequently in test anxiety treatment. The primary goal of behavioral intervention is to manage physiological arousal and develop coping behaviors, rather than decrease worries and irrational thoughts (Zeidner, 1998). Studies show that systematic desensitization and relaxation training are the most common behavioral interventions, and both

have effectively decreased test anxiety (Ergene, 2003; Meichenbaum, 1972; Wigfield & Eccles, 1989). A more recent study by Larson, El Ramahi, Conn, Estes, and Ghibellini (2010) found that diaphragmatic breathing and progressive muscle relaxation training produced reductions in test anxiety for third graders. Other behavioral interventions such as anxiety induction, anxiety management training, and modeling have successfully reduced test anxiety (Sarason, 1975; Zeidner, 1998); however, the latter appear to have little effect at improving performance.

The emergence of cognitive theories of test anxiety led to the use of cognitive interventions, the focus of which is to alter the negative thought processes of test-anxious individuals (Zeidner, 1998). Interventions such as cognitive-attentional training teach students how to instruct themselves to redirect attention from self-preoccupied cognitions to the current task (Zeidner, 1998). Cognitive-attentional training has had positive results, such as reductions in test anxiety and improvements in performance (Wine, 1971; Zeidner, 1998). Additional cognitive interventions (e.g. cognitive restructuring) emphasize the recognition and modification of irrational thought patterns. Although variations of cognitive restructuring have resulted in significant decreases in test anxiety (Ergene, 2003), improvements in performance appear to be less common (Zeidner, 1998). Overall, cognitive test anxiety interventions have shown favorable results and continue to be a popular method of treatment.

Although both behavioral and cognitive interventions have received empirical support, cognitive behavioral therapy (CBT) has emerged as perhaps the most common anxiety treatment. A review of CBT meta-analyses by Butler, Chapman, Forman, and Beck (2005) revealed that CBT is an effective intervention for multiple psychological problems, including adult anxiety disorders and childhood internalizing disorders. Significant support for the long-term effectiveness of CBT was also found (Butler et al., 2005). A study comparing systematic

desensitization and CBT treatment consisting of cognitive insight therapy, attentional self-instruction training, coping imagery, and relaxation among college undergraduates revealed that CBT was more effective in reducing test anxiety and improving cognitive performance than systematic desensitization (Meichenbaum, 1972). Similarly, a study of ninth graders showed that students who received CBT treatment had significantly less test anxiety and significant improvements in GPA compared to a wait-list control group (Weems et al., 2009; as cited in von der Embse et al., 2013). However, not all studies using CBT have produced positive effects. In a meta-analysis of test anxiety interventions, behavioral ( $n = 42$ ) and cognitive ( $n = 17$ ) interventions had large effects sizes, while CBT ( $n = 9$ ) exhibited small effects (Ergene, 2003). Additionally, a universal CBT prevention program for fifth and sixth graders was successful in improving cognitive performance, but did not decrease students' test anxiety (Zeidner, Klingman, & Papko, 1988). Though treatment outcomes have been mixed, CBT and other eclectic interventions have been widely accepted because they target several domains of test anxiety (Zeidner, 1998).

It has recently been suggested that skill-based interventions, including study skills and test-taking skills training, are beneficial. These interventions teach students how to improve the processing, storage, and retrieval of information, as well as time management, organization, and comprehension skills (Zeidner, 1998). Study skills alone appear to be ineffective at decreasing test anxiety or improving performance, but the combination of study skills with behavioral, cognitive, or CBT interventions have produced greater reductions in test anxiety than other treatments alone (Algaze, 1995; Allen, 1971; Ergene, 2003; Hembree, 1988; as cited in Zeidner, 1998).

## **Test-Taking Skills Intervention**

Test-taking skills instruction is a different, but related, skill-based intervention. Multiple studies have provided evidence for its effectiveness in improving academic performance. A meta-analysis of test-taking skills interventions for elementary, middle, and high school students resulted in significant improvements on achievement test scores (Samson, 2001). Additionally, these interventions have improved academic performance for college students and disabled students (Carter et al., 2005; Holzer, Madaus, Bray, & Kehle, 2009; Hughes, Deshler, Ruhl, & Schumaker, 1993; Kirkland & Hollandsworth, 1980). In comparison to behavioral, cognitive, and CBT approaches, test-taking skills interventions appear to be one of the most effective methods of improving academic performance across age groups.

These interventions have also successfully reduced test anxiety for a variety of students. In a study of two groups of adolescents with high-incidence disabilities, significant decreases in test anxiety were found for one group following a test-taking skills intervention (Carter et al., 2005). Additionally, four of five learning-disabled college students also reported decreases in test anxiety following test-taking strategy instruction (Holzer et al., 2009). Although few studies have been conducted with elementary students, Beidel, Turner, and Taylor-Ferreira (1999) piloted a skill-based program to reduce test anxiety for students in fourth through seventh grade. Testbusters was designed to teach study habits, study skills, and test-taking skills in a group or individual format. Results showed that students reported significant decreases in test anxiety and distress, as well as overall significant improvements in GPA. However, it is unclear which treatment components were responsible for the outcomes.

## **Purpose of the Study**

The existing literature includes a number of studies confirming the effectiveness of various test anxiety interventions, but few have been examined with elementary students. It has been suggested that test anxiety develops in third grade and increases over the next several years. It also appears that test anxiety may be an indicator of additional anxiety difficulties, with nearly 60% of highly test-anxious students meeting criteria for an anxiety disorder (Beidel et al., 1999; King et al., 1995). Given the emphasis on standardized testing with young students, treating test anxiety would be beneficial not only for student mental health, but the validity of school performance outcomes as well. Because there is a negative relationship between test anxiety and student perception of ability, an intervention that improves that perception may concurrently reduce test anxiety (Wigfield & Eccles, 1989). As such, a test-taking skills intervention may be effective in decreasing test anxiety in elementary students. However, most that have been conducted with elementary students have only measured performance outcomes.

In order to address these gaps in the research, the purpose of the current study was to evaluate a brief school-based test-taking skills intervention and its effects on test anxiety and test performance in 4<sup>th</sup> grade students. The skills in this intervention were targeted for use on the LEAP standardized test taken in the spring of the academic year. Quantitative measures were used to determine the efficacy of the intervention in reducing test anxiety as well as improving test performance. The following research questions were addressed: (a) Will a test-taking skills intervention conducted in small group format decrease test anxiety in fourth grade students? (b) Will the intervention improve performance (test scores) on a shortened version of the LEAP practice test?

## METHOD

### Participants

Participants were selected from 4<sup>th</sup> grade general education classrooms in two southeast Louisiana public schools. Informed consent from the parent was obtained before screening participants for test anxiety, and students concurrently participating in psychotherapy or pharmacological treatment for anxiety were excluded from this study. Based on a power analysis (G\*Power 3; Faul, Erdfelder, Lang, & Buchner, 2007) with a significance level of  $\alpha = 0.05$  and an effect size of  $d = .5$ , this study required at least 34 participants to reach a desired power of .80. Originally, students meeting or exceeding the high test anxiety cut-off score of 79 (see below) were to be included in this study. However, students were slow to return consents, and only 15 students scored in the high test anxiety range. As such, the decision was made to include students scoring at or above the group test anxiety mean ( $M = 66.4$ ). Therefore, all participants scoring 66 or above on the test anxiety screener were included in this study. During the study two participants transferred schools, one elected to drop the study, and one only attended three of six intervention sessions; as such, their data were not included for analysis. Final participants included 24 students. Demographic variables for participants are provided in Table 1 below.

Table 1. Demographic Variables.

Variable	Descriptor	Intervention n = 12	Wait-list Control n = 12	Total N = 24
Gender	Male	5 (41.67%)	3 (25.00%)	8 (33.33%)
	Female	7 (58.33%)	9 (75.00%)	16 (66.67%)
Race	Caucasian	6 (50.00%)	1 (8.33%)	7 (29.17%)
	African American	4 (33.33%)	8 (66.67%)	12 (50.00%)
	Asian	0 (0.00%)	2 (16.67%)	2 (8.33%)
	Other	2 (16.67%)	1 (8.33%)	3 (12.50%)

## **Experimental Design**

This study utilized a randomized control trial to examine the effectiveness of the test-taking skills intervention. Specifically, a split plot design was used with two groups (intervention and wait-list control) as the between-subjects factor and three points in time (pretest, posttest, follow-up) as the within-subjects factor. Test anxiety and test performance data were collected for the two groups prior to intervention, after intervention completion for the intervention group, and after intervention completion for the wait-list control group.

## **Materials and Measures**

**Test-Taking Skills Intervention.** The intervention was conducted as a pull-out group series of six 30-minute sessions and provided students with a set of skills to use when taking standardized tests. The scripted intervention was written by the author and based on the Strategic Instruction Model (SIM) developed by researchers at the University of Kansas Center for Research on Learning. Specifically, skill instruction was loosely based on the instructional model outlined by Ellis, Deshler, Lenz, Schumaker, and Clark (1991), emphasizing the description, modeling, and verbal rehearsal of skills, as well as opportunities for practice with corrective feedback provided by the interventionist.

Six age appropriate test-taking skills were taught: pay attention to directions, read the question and all answers completely, answer the question or mark it for later, match your numbers (match the question number in the test booklet to the number on the answer sheet), when you get to the end start again (return and answer previously unanswered questions), and check that every question has an answer. These strategies were adapted for use with upper elementary students, including age appropriate language and simplified lessons. Additionally, each intervention session included the rationale and appropriate setting for skill use.

***Children's Test Anxiety Scale.*** The primary dependent variable in this study was self-reported test anxiety. The *Children's Test Anxiety Scale* (CTAS; Wren & Benson, 2004) is a self-report test anxiety assessment instrument for children ages 8 through 12. The CTAS contains 30 items reflecting three dimensions of test anxiety: thoughts, autonomic reactions, and off-task behaviors. *Thoughts* include worrisome cognitions concerning test performance (e.g. "While I am taking tests, I worry about failing"). *Autonomic reactions* include somatic symptoms that present themselves in evaluative testing situations (e.g. "While I am taking tests, my heart beats fast"). *Off-task behaviors* include distracting behaviors that are unrelated to the test (e.g. "While I am taking tests, I look around the room"). Students ranked each item on a 4-point Likert scale, ranging from 1 (*Almost Never*) to 4 (*Almost Always*). All items were summed to obtain a total score, ranging from 30 to 120, with higher scores indicating higher test anxiety. A score of 30 to 45 indicated low test anxiety, a score of 46 to 78 indicated average test anxiety, and a score of 79 to 120 indicated high test anxiety. Because the screening sample size was limited due to low response rate, the researcher elected to include all participants exceeding the test anxiety average of the screening group. The CTAS exhibits a high internal consistency reliability of .92. It also exhibits good construct validity, with all item-factor loadings being statistically significant, ranging from .37 to .76.

**Louisiana Educational Assessment Program Sample Tests.** The second dependent variable was performance on standardized assessment sample tests. The Louisiana Educational Assessment Program (LEAP; Louisiana Department of Education) is an annual criterion-based set of assessments completed by Louisiana students in 4<sup>th</sup> and 8<sup>th</sup> grade. The LEAP is designed to measure whether a student meets academic standards in English language arts (ELA), mathematics, science, and social studies. On each test a student may earn a score of *Advanced*,

*Mastery, Basic, Approaching Basic, or Unsatisfactory.* Failure to attain at least *Basic* on ELA or mathematics, as well as failure to attain at least *Approaching Basic* on the remaining subject, can result in summer school or grade retention.

In this study, previously released ELA and mathematics questions were combined to create abbreviated sample tests. Phase 1 of the LEAP, which includes ELA writing and mathematics constructed-response items, is completed prior to the weeklong Phase 2. As such, sample tests and intervention sessions focused on Phase 2 of the LEAP. Based on a review of the number of items and subtests, as well as time estimations, sample tests contained the following: 8 mathematics multiple choice questions and 1 ELA reading passage with 6 to 8 multiple choice or short answer questions. Questions were chosen at random from a pool of items created for each subtest (e.g. mathematics multiple choice, ELA reading and responding passages). Although the LEAP is not timed, participants were given 1 hour to complete each sample test in order to minimize participant fatigue and increase evaluative threat.

Three sample test forms were created. At pretest one-third of students completed Form A, one-third completed Form B, and the remaining third completed Form C. This procedure was identical at posttest and follow-up, with no student receiving the same test twice. This procedure was used to control for possible variations in test form difficulty. Practice tests created according to the protocol described above were also used during instruction of the test-taking skills intervention.

**Treatment Integrity.** Treatment integrity was assessed by collecting permanent products in the form of self-report checklists completed by the interventionist during intervention sessions. Treatment integrity was assessed for 92% of intervention group sessions and 75% of wait-list control sessions during the test-taking skills intervention, for a total of 83% of

intervention sessions. Basic steps of the intervention for each session were listed. The researcher recorded a “0” if the step was not completed or a “1” if the step was completed. Scores were summed, divided by the total number of steps, and multiplied by 100. Average treatment integrity for the intervention group was 100%, and average treatment integrity for the wait-list control group was 100%, for a total of 100% self-reported treatment integrity.

**Interobserver Agreement (Treatment Integrity).** A second observer independently scored treatment integrity for 25% of intervention group sessions and 25% of wait-list control group sessions during the test-taking skills intervention, for a total of 25% of sessions. The two records were scored as the number of agreements divided by the total number of agreements plus disagreements, multiplied by 100. An agreement was defined as both data collectors scoring the same occurrence or nonoccurrence of a step during a session. A disagreement was defined as one data collector scoring the occurrence of a step while the other scored the nonoccurrence of a step. Average IOA for intervention group sessions was 97% (range 90-100%), and average IOA for wait-list control sessions was 100%, for a total average IOA of 98.5%.

**Interobserver Agreement (CTAS).** A second rater independently scored 40% of the total CTAS self-reports across pretest, posttest, and follow-up. The two records were scored as the total score obtained by one rater divided by the total score obtained by the second rater, multiplied by 100. Average IOA for CTAS self-reports was 100%.

## **Procedure**

**Interventionist training.** Two undergraduate interventionists were trained to implement the test-taking skills intervention during a two-hour training conducted by the researcher. Training included a brief discussion of existing research and the purpose of the current study. Interventionists were provided the scripts for all assessment and intervention sessions. The

researcher described and briefly modeled each assessment and intervention session.

Interventionists took turns role playing both an assessment and intervention session, one as an interventionist and the other as a participant. Each played the part of the interventionist twice and was provided praise and corrective feedback by the researcher. The researcher provided ongoing communication and feedback throughout the course of the study.

**Pretest.** Informed consent from the parent and assent from participating students was obtained, signifying their understanding of random assignment to treatment groups. Participants were asked to complete the CTAS, and participants scoring above the CTAS group average of 66 were asked to participate further in the study. The 28 participants were randomly assigned to either intervention or wait-list control groups, with randomization occurring across settings. In sum, both schools included participants randomized into the intervention group and wait-list control group. Both groups included 14 participants; however, one participant in the intervention group missed three intervention sessions, and one participant from the wait-list control group elected to drop from the study. Additionally, one participant from each group transferred schools. As such, data analysis included 12 participants in each group.

Participants in both the intervention and wait-list control groups were asked to complete a LEAP sample test. Prior to administration of the test, participants were informed that the test is a measure of academic ability and predicts how well they will perform in school this year. Participants were told to complete the test to the best of their ability and try to make the highest possible score, but the test would not affect their grade in class. Following completion of the practice test, each test was scored as a percentage out of 100 to be used as a pretest measure of test performance.

A mistake in protocol resulted in participants at one school completing the LEAP pretest measure separately, with the wait-list control group completing the measure the following day. However, both assessments were conducted as instructed in the manual; therefore, it was determined it is likely that the data provided an accurate measure of test performance.

**Intervention Phase 1.** Following the collection of pretest measures, trained interventionists implemented sessions with the intervention group at each school. The interventionists followed the scripted intervention protocol, with exceptions provided in the next section. Participants in the wait-list control group received instruction as usual in the regular classroom.

**Modifications to intervention with Group 1.** During the delivery of intervention session 4 (verbal rehearsal of skills) at one school, it was apparent that participants were struggling to recite the skills in the correct order. As a result, an additional 10 minutes were dedicated to the skill naming game; additionally, participants worked together to arrange the skills posters in the correct order. Time constraints resulted in the inability to conduct individual verbal skill naming tests; therefore, individual proficiency in naming the skills in the correct order could not be determined. The test-taking skills treatment manual is available from the author by request.

**Posttest.** Following the completion of the test-taking skills intervention, both the intervention and control groups were provided instructions identical to those at pretest and asked to complete a second LEAP sample test and CTAS.

**Intervention Phase 2.** Following the completion of posttest measures, the intervention and control groups were switched. The original intervention group received instruction as usual,

and the wait-list control group received the test-taking skills intervention following the same protocols described above.

**Follow-up.** Following the completion of the intervention, both groups were again provided instructions identical to those at pretest and asked to complete a third LEAP sample test and CTAS. This served as a follow-up measure for the intervention group and a posttest measure for the wait-list control group.

## RESULTS

### Analyses

Using SPSS 21.0, intervention outcomes were assessed through a series of analyses of covariance (ANCOVA) for both total CTAS scores and LEAP sample test scores. ANCOVA was chosen in order to control for possible variance in pretest scores between groups. Levene's tests for each of the six ANCOVAs were not significant, which indicates that the error variance of the dependent variable was equivalent across groups in each analysis. Table 2 includes the quantitative data for the CTAS and LEAP sample test scores.

Table 2. Children's Test Anxiety Scale (CTAS) and Louisiana Educational Assessment Program (LEAP) Sample Test Scores.

Measure <sup>a</sup>	Time <sup>b</sup>	Intervention <i>M</i> ( <i>SD</i> )	Wait-list <i>M</i> ( <i>SD</i> )	<i>F</i> <sup>c</sup>	<i>P</i>	Partial $\eta^2$ ( <i>d</i> )
<b>CTAS (30-120)</b>	T1	78.83 (12.97)	83.50 (08.26)			
	T2	73.92 (13.85)	82.17 (16.64)	1.045 <sup>d</sup>	.318	.047 (.44)
	T3	73.33 (13.43)	76.67 (17.30)	0.338 <sup>e</sup>	.567	.016 (.26)
<b>LEAP (0-100)</b>	T1	55.92 (33.26)	56.42 (20.00)			
	T2	74.73 (18.11)	59.42 (18.69)	4.198 <sup>d</sup>	.054	.173 (.91)
	T3	59.08 (25.19)	54.08 (30.32)	0.130 <sup>e</sup>	.722	.006 (.16)

Note. <sup>a</sup> Scale ranges given in parentheses. <sup>b</sup> T1 = pretest, T2 = posttest, T3 = follow-up. <sup>c</sup> Based on analysis of covariance (ANCOVA) with group (intervention vs. wait-list) as the between-subjects factor and time (<sup>d</sup> pretest or <sup>e</sup> posttest) as covariate.

**CTAS.** Prior to participating in the test-taking intervention (pretest), CTAS scores for the intervention group ranged from 66 to 102 ( $M = 78.83$ ,  $SD = 12.97$ ). These scores were comparable to scores for the wait-list control group, which ranged from 69 to 99 ( $M = 83.5$ ,  $SD = 8.26$ ).

Similar analyses were conducted following completion of the test-taking skills intervention with the intervention group (posttest). At posttest, CTAS scores for the intervention group ranged from 52 to 95 ( $M = 73.92$ ,  $SD = 13.85$ ), whereas scores for the wait-list control group remained near pretest level, ranging from 46 to 107 ( $M = 82.17$ ,  $SD = 16.64$ ). An

ANCOVA was conducted using group as the independent variable, posttest CTAS scores as the dependent variable, and pretest CTAS scores as the covariate. Results indicated that, although CTAS scores for the intervention group slightly decreased, there was no significant difference between groups on CTAS from pretest to posttest,  $F(1, 21) = 1.045, p = .318, \text{partial } \eta^2 = .047$ .

Analyses were conducted following completion of the test-taking skills intervention with the wait-list control group (follow-up). At follow-up, CTAS scores for the intervention group ranged from 51 to 92 ( $M = 73.33, SD = 13.43$ ), and scores for the wait-list control group ranged from 42 to 106 ( $M = 76.67, SD = 17.30$ ). An ANCOVA was conducted using group as the independent variable, follow-up CTAS scores as the dependent variable, and posttest CTAS scores as the covariate. Results showed that there was no significant difference between groups on the CTAS scores from posttest to follow-up,  $F(1, 21) = 0.338, p = .567, \text{partial } \eta^2 = .016$ . This indicates that, although the decrease in CTAS scores in the intervention group maintained from posttest to 1-month follow-up and CTAS scores for the wait-list control group slightly decreased, the overall decrease in the wait-list control group's scores was not statistically significant.

An ANCOVA was conducted using group as the independent variable, follow-up CTAS scores as the dependent variable, and pretest CTAS scores as the covariate. Results showed that there was no significant difference between groups on CTAS ratings from pretest to follow-up,  $F(1, 21) = .004, p = .949, \text{partial } \eta^2 = .000$ . This indicates that, although decreases in CTAS scores were not significant, test anxiety for both the intervention and wait-list control groups decreased at similar levels.

**LEAP.** Analyses of percentage correct on LEAP sample tests were identical to those used during CTAS data analysis. Prior to participating in the test-taking intervention (pretest), LEAP

sample test scores for the intervention group ranged from 0 to 100 ( $M = 55.92$ ,  $SD = 33.26$ ).

These were comparable to scores for the wait-list control group, which ranged from 25 to 88 ( $M = 56.42$ ,  $SD = 20.00$ ).

Following completion of the test-taking skills intervention with the intervention group (posttest), LEAP sample test scores for the intervention group ranged from 38 to 100 ( $M = 74.73$ ,  $SD = 18.11$ ), and scores for the wait-list control group remained near baseline level, ranging from 25 to 81 ( $M = 59.42$ ,  $SD = 18.69$ ). An ANCOVA was conducted using group as the independent variable, posttest LEAP scores as the dependent variable, and pretest LEAP scores as the covariate. Results approached a significant difference between groups on LEAP sample test performance from pretest to posttest,  $F(1, 20) = 4.198$ ,  $p = .054$ , partial  $\eta^2 = .173$ . This indicates that participants who completed the intervention received relatively higher LEAP sample test scores than those in the wait-list control group, with 17.3% of the variance being explained by group membership.

Following completion of the test-taking skills intervention with the wait-list control group (follow-up), LEAP sample test scores for the intervention group ranged from 25 to 100 ( $M = 59.08$ ,  $SD = 25.19$ ), and scores for the wait-list control group ranged from 0 to 100 ( $M = 54.08$ ,  $SD = 30.32$ ). An ANCOVA was conducted using group as the independent variable, follow-up LEAP scores as the dependent variable, and posttest LEAP scores as the covariate. Results showed that there was no significant difference between groups on LEAP sample test performance from posttest to follow-up,  $F(1, 20) = .130$ ,  $p = .722$ , partial  $\eta^2 = .006$ . Upon further examination of the data, this indicated that LEAP scores for the intervention group did not maintain and returned to baseline levels, and scores for the wait-list control group did not increase following the test-taking skills intervention.

Lastly, an ANCOVA was conducted using group as the independent variable, follow-up LEAP scores as the dependent variable, and pretest LEAP scores as the covariate. Results showed that there was no significant difference between groups on LEAP sample test performance from pretest to follow-up,  $F(1, 21) = .257, p = .618, \text{partial } \eta^2 = .012$ . Both the intervention group and the wait-list control group had similar LEAP scores at pretest and follow-up.

## DISCUSSION

The purpose of the current study was to examine the effectiveness of a brief test-taking skills intervention and its effect on test anxiety and test performance in 4<sup>th</sup> graders preparing for standardized testing. It was hypothesized that participant's test anxiety would decrease and test performance would increase following completion of the test-taking skills intervention, and these results would maintain at 1-month follow-up for the intervention group. Results indicated that, while the intervention resulted in slight decreases in test anxiety, it was not effective at producing significant decreases. Additionally, the effects of the intervention on test performance were mixed, and any positive increases in test performance were not maintained at 1-month follow-up.

Average test anxiety ratings decreased from baseline levels in the high test anxiety range to final levels in the average test anxiety range. Additionally, while these results weren't statistically significant, effect sizes of intervention on test anxiety ratings for the intervention group (partial  $\eta^2 = .047$ ; equivalent to  $d = 0.44$ ) and wait-list control group (partial  $\eta^2 = .016$ ; equivalent to  $d = 0.26$ ) were indicative of a small effect. These results are consistent with those found in similar studies conducted with adolescents and college students (Carter et al., 2005; Holzer et al., 2009). However, decreases in test anxiety were not as strong as those found in a study of the Testbusters intervention with elementary students (Beidel, Turner, & Taylor-Ferreira, 1999). In contrast to Testbusters, a multicomponent skills-based intervention, this study utilized a test-taking skills instruction only approach. While the effects of this intervention were small, these results provide initial evidence that solely teaching test-taking skills to elementary students can result in decreases in test anxiety. However, the clinical meaning of this decrease is unclear as limited sample size may have resulted in a lack of power, which could have

contributed to the inability to detect significant effects. Given that the intervention was conducted immediately prior to standardized testing, at which time it is assumed that test anxiety would be at its peak, the test-taking skills intervention rather may have served as a buffer that kept participant anxiety from increasing. This possibility is discussed further below.

In regards to test performance, the intervention group appeared to respond to the test-taking skills intervention, with posttest scores increasing by 19% and indicating a large effect (partial  $\eta^2 = .173$ ; equivalent to  $d = 0.91$ ). This increase was consistent with the existing literature in which test-taking skills instruction resulted in sizeable gains in academic performance for multiple populations (Carter et al., 2005; Holzer et al., 2009; Hughes et al., 1993; Kirkland & Hollandsworth, 1980; Samson, 2001). Follow-up measures have rarely been included in the research, but a study by Holzer et al. (2009) showed that 4 of 5 participants maintained increases in academic performance at 2-week follow-up; however, 2 weeks is rather short term. It is clear that the literature concerning the maintenance of intervention outcomes is scarce, and this study attempted to bridge that gap by assessing maintenance of test performance at 1-month follow-up. Unfortunately, the results of this study returned to pretest levels at follow-up.

Strangely, the wait-list control group did not exhibit any improvements in test performance following completion of the intervention. Because the follow-up measure for the intervention group also served as the posttest measure for the wait-list control group, it is possible that other variables may have confounded the assessment results collected at this point in time, such as fatigue from increases in standardized testing practice in the classroom.

## **Limitations**

Several limitations of this study should be noted. This intervention was developed to be implemented over six 30-minute sessions, with each session building on the last. However, seven participants (29%) were absent for one of the various intervention sessions and did not receive any make-up sessions. Additionally, two participants (8%) were absent for two sessions and received only one make-up session. The validity of the current results is limited because a number of participants did not receive all sessions of the intervention.

An additional limitation of this study was the time of the academic year in which the intervention was implemented. Data collection and intervention sessions were conducted over an eight week span during the months of February and March. Because standardized testing in Louisiana takes place during the beginning of April, each test anxiety and test performance assessment was conducted on dates consecutively closer to the onset of standardized testing. It is possible that this confounded the intervention and weakened the outcomes related to test anxiety because, as participants began to anticipate standardized testing, test anxiety may have increased. With this in mind, the current intervention may have instead served as a buffer to any increases in test anxiety that could have occurred as standardized testing approached.

Another limitation was the use of repeated LEAP sample tests to induce test anxiety and collect test performance data. The intervention group substantially improved their LEAP sample test scores from pretest to posttest, but these results were not maintained at 1 month; additionally, the wait-list control group did not show any improvements in test performance. Prior to standardized testing, it is likely that participants took part in additional practice tests in the classroom. Additionally, participants were informed during assessment that their results would not affect their grade in class. As standardized testing approached, participants may have

become fatigued with completing LEAP-related practice tests and lacked the motivation to complete the assessments to the best of their ability. This may have limited the validity of the current results.

### **Future Directions**

While this study had several limitations and provided mixed results, a slight decrease in test anxiety was observed. These findings extend the research on test-taking skills interventions and their effects on test anxiety in elementary students by providing preliminary evidence that a test-taking skills intervention alone can produce decreases in test anxiety. As such, future research may benefit from a replication of this study including a) larger temporal distance between intervention and state standardized testing, b) more stringent criteria for intervention session absences, and c) larger sample size. Conducting the test-taking skills intervention in the fall and including maintenance sessions prior to standardized testing in the spring may result in more effective acquisition of test-taking skills, increased fluency in skill use, more opportunities for feedback, and generalization of various skills to classroom tests. This may provide more differentiation between intervention and control groups. Additionally, conducting the intervention in the fall may provide additional time to conduct make-up sessions for students who are absent from a session. Finally, the small sample size used in this study may have decreased the power in detecting intervention effects. Given the prevalence of test anxiety and increased emphasis on standardized testing at earlier ages, as well as the preliminary positive effects of this test-taking skills intervention on test anxiety reduction, continued research into the remediation of test anxiety is warranted.

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## APPENDIX A: INTERVENTION SESSION 1 - DESCRIBE

In Session 1 the interventionist will review the purpose for learning test-taking skills, as well as the improvements that students might see after completing the intervention. The first three test-taking skills will be described in detail.

### **Materials:**

- Attendance sheet
- Treatment Integrity form
- Skills posters

1. **INTRODUCTION.** Good morning guys! My name is \_\_\_\_\_. I'm a student just like you, but I go to LSU! I'm here to help you all learn some ways to feel more comfortable and prepared to take important tests! Sometimes tests can be scary, but they don't have to be if you're prepared!
2. **REVIEW PRETEST.** Last week each of you took a short test. Don't worry; this test doesn't affect your grade in class!
  - a. I can tell you all worked really hard! Sometimes during tests, we get worried about how we will perform. This has happened to me! I was nervous, my heart was beating fast, I kept looking around the room, and I had a hard time concentrating on the test. Has your body ever felt funny before or during a test? [Allow students time to respond]. Sometimes do you worry a lot while taking a test? [Again, allow time for responses].
  - b. It's okay to feel nervous, but sometimes we may not do as well on the test as we'd like *because* we're nervous. I'm going to help you all learn some ways to be better test takers.
3. **EXPLAIN PURPOSE OF LEAP.**
  - a. In the spring, everyone here is going to take a big test. Do you know what test that is? [Elicit responses, such as the LEAP]. **Right! You are going to take a test that every 4<sup>th</sup> grader in Louisiana has to take. It's called the LEAP.**
  - b. **Why do you think you take the LEAP?** [Elicit responses, such as to show how well we do in school, how much we know]. **Good job! Everyone takes this test so we can see how well all the kids in Louisiana are learning! The LEAP test asks questions about some of the things your teachers teach you in class like English, math, science, and social studies. The LEAP is different than the tests you take in class because every 4<sup>th</sup>**

**grader in Louisiana takes the exact same test as you. Your teachers want you to do your best on the LEAP test so you can show what great learners you are!**

- c. Do you want to do well on the LEAP?** [Allow students to respond]. **Great! I think you all can do well on the LEAP because you've worked very hard in school.**

**4. EXPLAIN TEST-TAKING SKILLS.** Over the next few weeks, I'm going to meet with you to teach you some skills you can use to take the LEAP. These skills can help you feel more comfortable and do better on the test.

- a. Does anyone know what a skill is?** [Elicit responses such as something you use to do a task well, a talent, etc.] **Yes! A skill is an ability that we use to do something well. We learn skills by practicing!**

- b. I'm going to show you some special skills for taking tests, and I'm going to help you practice so you'll do a super job on the LEAP test. If I work hard to teach you these skills, will you work hard to learn them?** [Elicit responses]. **Good! We are going to work together to make you the best test taker you can be.**

- c. Raise your hand if you think these skills will help you take tests.** [Allow students time to raise their hands]. **Wonderful! I think they will help you, too. If you work hard on your school work and learn these skills, you can be more comfortable when you take these tests.**

**5. DESCRIBE POSSIBLE RESULTS.**

- a. Other kids just like you have learned how to use test-taking skills. Using these skills has helped them feel better while taking the test, and even helped them get higher scores! Using test-taking skills could help you, too.**

- b. Remember, it's important that you listen carefully to me and answer my questions if you can. If you do this, I will be able to help you learn these skills. Are there any questions before we start?** [Answer any remaining questions]. **Wonderful! Let's get started!**

**6. DESCRIBE 1<sup>st</sup> SKILL:** The first skill is *Pay Attention to Directions* [Hold up the poster that says "Pay Attention to Directions"].

- a. Paying attention to the directions means that you are listening to the directions that the teacher is saying before the test. It also means that you are carefully reading the directions along in your test booklet when the teacher asks you to.**

- b. **Why do you think it's important to pay attention to the directions?** [Elicit responses such as, "So we know what to do on the test" or "So we don't make a mistake"]. **Right! It's important to pay attention to directions so you will know exactly what to do, and you won't make a careless mistake. The directions in your test booklet will also tell you where and how to answer the question.**
  - c. **Can anyone think of some examples of what might happen if you don't pay attention to the directions?** [Elicit responses such as, "We might get confused on the test" or "We might not do as well on the test"]. **Yes! If you don't pay attention to the directions, you might miss something really important. You could get confused, mark your answer wrong, start on the wrong section, or not do as well as you can.**
  - d. **What are some things you could do to help you pay attention to the directions?** [Elicit responses such as, "Keep your eyes and ears on the teacher" or "Read the instructions with the teacher"]. **That's right. You can keep your eyes and ears on your teacher and listen to what she says. You can also look at the directions in your test booklet and read along with the teacher. Remember to raise your hand if you have a question.**
  - e. **Paying attention to directions will help you know exactly what to do so you do your best on the test!**
  - f. **What is the first test-taking skill?** [Elicit the response "Pay attention to directions"]. **Great job! Pay attention to directions. Now you know what the first skill is.**
- 7. DESCRIBE 2<sup>nd</sup> SKILL:** The second skill is *Read the Question and all Answers Completely* [Hold up the poster that says "Read the Question and All Answers Completely"].
- a. **This skill has two parts: reading the question completely, and reading all the answer choices. Reading the question completely means reading all the words of the question to the very end. Reading the whole question can give you information that will help you get the right answer.**
  - b. **Why do you think it's important to read the entire question?** [Elicit responses such as, "So you don't make a mistake" or "So you can know what to look for in the answers"]. **Yes! Reading the whole question can help you answer because you know exactly what the question is asking. It will help you understand what answer you're looking for.**
  - c. **What might happen if you don't read all the words of the question?** [Elicit responses such as, "You might get the answer wrong" or "You might not understand the question"].

**You're right! If you don't read the whole question, you could get confused. Reading the whole question will help you pick the right answer.**

- d. What about the answers? Sometimes the LEAP test has multiple choice questions. Multiple choice questions ask you to pick the right answer out of a lot of possible answers. Sometimes the first option is right! But sometimes the last option is better. Why do you think you need to read all the answers before you pick an answer? [Elicit responses such as, "So you pick the right answer" or "So you can see which answer is best"]. Good job! You should read all the answers first so you can find the *best* answer.**
  - e. What are some ways you can make sure that you remember to read all the answers? [Elicit responses such as, "Point to them with your finger" or "Point to them with your pencil]. Yes! An easy way to make sure you're reading all the answers is to point your finger to each one as you read it. Or you can point to it with your pencil! This will help you make sure you are reading every choice from first to last, and you don't skip any.**
  - f. Reading the question completely will tell you what to look for, and reading all the answer choices will keep you from skipping the correct answer!**
  - g. What is the second test-taking skill? [Elicit the response "Read the question and all answers completely"]. Perfect! Read the question and all answers completely. You are all so smart.**
- 8. DESCRIBE 3<sup>rd</sup> SKILL: The third and last skill we will learn today is *Answer It or Mark It for Later*. [Hold up the poster that says "Answer It or Mark It for Later"].**
- a. This skill tells you what to do when it's time to answer a question. It also has two parts: answer the question by bubbling in or writing on your answer sheet, or mark the question for later. You should answer the question if you know the right answer. If you don't know the answer or you're taking too long, you can put a little pencil mark next to it on your test booklet and answer sheet.**
  - b. What do you think are some good things to do when answering a test question? [Elicit responses such as, "Bubble in and write neatly" or "Cross off wrong answers"]. You've got it! The first thing you should do is cross off the answers you *know* are wrong. That way you don't have to waste time reading them again and you'll have a better chance**

**of picking the right answer! You can do this by putting a line through the letter next to that answer.**

- c. What about bubbling in answers? What should you do?** [Elicit responses such as, “Bubble it all in” or “Bubble in the right one”]. **Make sure you color the bubble with the same letter as the answer you chose! So if you pick answer “A,” you need to fill in the bubble that has an “A” in it! Try to do it neatly, but don’t take too long!**
- d. What if you have to write an answer? What should you do?** [Elicit responses such as, “Write neatly”]. **Good! You should write neatly so that it’s easy to read your answer. If it’s hard to read your answer, you may not get it right! The person grading your test may not be able to read it!**
- e. Some of the questions on the LEAP test are easy, but some are really hard. Questions that are hard can take a lot of time to answer. If you come to a question you can’t answer, or that is taking too long, you can mark it and save it for later! Doing this will help you get to the questions that you know so you can get those points!**
- f. Why do you think it’s important to save the really hard questions for later?** [Elicit responses such as, “You may not finish the test” or “If you move on, you can answer more questions”]. **Right! Saving the hard questions for later will give you more time to answer the questions you DO know! The more answers you know, the better you will do on the test!**
- g. If you skip a question, where do you think you should put your pencil mark?** [Elicit responses such as, “Next to the question you don’t know” or “Next to the question on your answer sheet”]. **It’s very important that you put a pencil mark next the number of the question you are having trouble with, but you need to put a pencil mark next to that number on your answer sheet too so you remember to skip it! Putting the pencil mark on your answer sheet will help you remember to leave it blank. If you don’t, you might forget to leave it blank for later. Then all the answers you put after that will be confused! So make sure you make a pencil mark big enough for you to see next to the number of the question and the SAME number on your answer sheet! That way you can move on to questions you CAN answer!**

- h. **Answering or marking your question for later will help you answer more questions you know before you think about the hard ones! This can help you do your best on the test.**
- i. **What is the third test-taking skill?** [Elicit the response “Answer or Mark it for later”]. **Wonderful! Answer it or mark it for later.**

**9. REVIEW THE FIRST THREE SKILLS.**

- a. **You have just learned about the first three skills that can help you be a better test taker! *Pay Attention to Directions, Read the Question and All Answers Completely, and Answer It or Mark it for Later.***
  - b. **Now I want everyone to tell me the first three skills! What is the first test-taking skill?** [Hold up the corresponding poster and elicit the response “Pay attention to directions”]. **Yes! What about the second skill?** [Hold up the corresponding poster and elicit the response “Read the question and all answers completely”]. **Great! What about the third skill?** [Hold up the corresponding poster and elicit the response “Answer or mark it for later”]. **You guys are awesome!**
  - c. **What if I only give you some of the words to each skill? Do you think you can still remember the skills? I bet you can! Who can raise their hand and tell me the first skill, *Pay Attention to...?*** [Choose a student with hand raised and elicit the response, “Pay attention to directions”]. **Good job! Thank you for paying attention to directions and raising your hand. Very good listening. Who can raise their hand and tell me the second skill, *Read the Question and what Completely?*** [Choose a student with hand raised and elicit the response, “Read the question and all answers completely”]. **That’s right! Read the question and all answers completely. Who can raise their hand and tell me the third skill, *Answer It or...?*** [Choose a student with hand raised and elicit the response, “Answer it or mark it for later”]. **Awesome! Answer it or mark it for later.**
  - d. **What if I don’t give you any clues? Let’s try to say them altogether! What is the first skill?** [Elicit first skill]. **Yes! Pay attention to directions. Second?** [Elicit second skill]. **Right! Read the question and all answers completely. Third?** [Elicit third skill]. **That’s it! Answer it or mark it for later. Wow, you guys are awesome.**
- 10. PRAISE STUDENTS FOR HARD WORK. Great job everyone! I think you guys have learned enough for today. You already know three skills that will help you do**

**better on the LEAP tests *Pay Attention to Directions, Read the Question and All Answers Completely, and Answer It or Mark It for Later.* Next time we meet, we're going to learn the last three skills. Once you have learned them all, I will help you all practice using these skills so you can use them on the LEAP test. That way you can be a better test taker and feel comfortable when you take the test! Does anyone have any questions?**  
[Answer any remaining questions]. **Okay, I will see you all next time! Please go back to your regular class.**

## APPENDIX B: CONSENT FORM

### **Title of Research Project:**

The effects of a test-taking skills intervention on test anxiety and test performance in 4<sup>th</sup> graders

### **Performance Sites:**

Your child's school.

### **Investigator:**

The principal investigator is George Noell, Ph.D., Professor, Psychology.

Please direct questions to him at (225) 578-4119.

### **Purpose of Research Project:**

Evaluate a treatment to decrease test anxiety and improve test performance prior to standardized testing.

### **Participant Inclusion:**

Children in 4<sup>th</sup> grade who are determined to have high test anxiety and are not currently using medication or therapy to treat anxiety.

### **Number of Participants:**

We will include 40-50 participants in the current investigation

### **Description of the Study:**

If you agree to allow your child to participate, he/she will participate in a 1-hour "testing" session every 3-4 weeks, for a total of three testing sessions. He/she will also participate in two or three 30-min treatment sessions per week, for a total of six sessions. The study will be conducted at your child's school.

Your child will participate in two different kinds of sessions. One is a "testing" session in which your child will take a 1-hour LEAP practice test and fill out a brief questionnaire, which will be done a total of three times. The second is a 30-min treatment session in which we will describe, model, and allow your child to practice basic test-taking skills, which will be done a total of six times.

### **Right to Refuse:**

Participation in this research project is completely voluntary. Your decision will not influence the care that he/she receives at your child's school. If you permit him/her to participate, you may withdraw your permission at any time during the study. His/her care will not be affected if you withdraw your permission.

### **Withdrawal:**

You may elect to withdraw your child from participation at any time, without consequence. If you wish to do so, contact Dr. Noell at the number listed above.

### **Benefits:**

The outcomes of this study may lead to our improved ability to teach your child to reduce test anxiety and improve test performance prior to standardized testing.

### **Financial Compensation:**

You will not receive any financial compensation for participation in this study, nor will any costs you incur as a result of participation (e.g., travel expenses) be reimbursed.

### **Risks/Discomforts:**

The only identified risks for participation in this study are related to confidentiality and time out of the school day.

**Measures taken to reduce risks:**

For time out of the school day, sessions have been tailored to be as brief as possible. Your child will only miss a short period of the regular school schedule for a maximum of two to three times per week. There will also be a span of three to four weeks in which your child will receive instructional as usual, and will not spend time out of class.

**Unforeseeable Risks:**

Although we have taken steps to anticipate and reduce as many risks as possible, there may be some unforeseen risks.

**Study-associated injury or illness:**

We have attempted to take precautions to reduce the risk of your child being injured or becoming ill during his/her participation in this study. Should an injury or illness occur despite these precautions during normal course of the study neither LSU or the researchers will be able to provide any compensation or medical care. This does not release the researchers from responsibility should your child be injured or become ill as a result of negligence. If your child sustains any illness as a result of his/her participation in this study, contact Dr. Noell at the number listed above.

**Alternatives:**

If your child does not participate in this study, he/she will receive the standard services provided by his/her school.

**Privacy:**

All information about your child’s status, progress, and outcome will be kept strictly confidential. To protect his/her privacy, we will use an alphabetic identifier in written records, and he/she will not be identified by name in research publications.

**New Findings:**

In the event that significant new findings are developed during the course of this research from this study or an independent source that may relate to your willingness to have your child continue to participate, such findings will be explained to you.

**Signatures:**

The study has been discussed with me and all my questions have been answered. I understand that additional questions regarding the study should be directed to the investigator listed above. I understand that if I have questions about participant’s rights or other concerns I can contact Dr. Robert C. Matthews, Institutional Review Board at (225) 578-8692. I agree with the terms above and acknowledge I have been given a copy of the consent form.

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Child’s Name (Print)  
Teacher (Print)

Child’s

---

Signature of the Participant’s Parent or Legal Guardian

Date

---

Investigator

Date

The participant's parent or legal guardian has indicated to me that he/she is unable to read. I certify that I have read this consent form to the parent or legal guardian and explained that by completing the signature line above the individual has given permission for \_\_\_\_\_ to participate.

---

Signature of Reader

Date

# APPENDIX C: INSTITUTIONAL REVIEW BOARD APPROVAL

## Application for Exemption from Institutional Oversight



Institutional Review Board  
 Dr. Robert Mathews, Chair  
 130 David Boyd Hall  
 Baton Rouge, LA 70803  
 P: 225.578.8692  
 F: 225.578.5983  
<http://lsu.edu/~isa.edu/irb>

Projects qualified for meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight at LSU are exempt from the usual IRB review process. Projects are exempted from IRB oversight if they are determined to be of minimal risk to subjects and if the project meets the criteria for exemption. This form helps the IRB determine if a project may be exempted, and is used to request an exemption.

Applicant, Please fill out the application in its entirety and include the completed application as well as parts A, E, F, listed below, when submitting to the IRB. Once the application is completed, please file the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at <http://www.lsu.edu/~isa.edu/irb/irb-exempt-projects-exemption-committee-members>

A Complete Application Includes All of the Following:

- (A) A copy of this completed form and a copy of parts B thru F.
- (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
- (C) Copies of all instruments to be used.
- (D) If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
- (E) The consent form that you will use in the study (see part 4 for more information)
- (F) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, access already on file with the IRB. Training Link: <http://prp.cibtraining.com/users/login.php>
- (G) IRB Security of Data Agreement: <http://www.lsu.edu/irb/irb-exempt-projects-exemption-committee-members>

1) Principal Investigator: George Bissell Rank: Professor  
 Dept: Psychology Ph: 5784119 E-mail: gbissell@lsu.edu

2) Co Investigator(s) please include department, rank, phone and e-mail for each. If student, please identify and name supervising professor in this space.  
Meredith Harris, Psychology, Graduate Student, 5784119, mharr112@gingers.lsu.edu



3) Project Title: The Effects of a Test-Taking Skills Intervention on Test Anxiety and Test Performance in 4th Graders

4) Proposal? (yes or no)  No If Yes, LSU Proposal Number \_\_\_\_\_

Also, FYI, either  This application completely matches the scope of work in the grant OR  More IRB applications will be filed later

5) Subject pool (e.g. Psychology students) 4th grade students  
 \*Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature [Signature] Date 8/24/2011 (in purple ink)

Exemption Expires: 10/27/2011  
 225-578-8692 / [www.lsu.edu/irb](http://www.lsu.edu/irb)  
 130 David Boyd Hall  
 Louisiana State University  
 Institutional Review Board  
 Dr. Robert C. Mathews, Chairman  
 STUDY EXEMPTED BY:  
 STUDY EXEMPTED BY:  
 Dr. Robert C. Mathews, Chairman  
 Institutional Review Board  
 Louisiana State University  
 130 David Boyd Hall  
 225-578-8692 / [www.lsu.edu/irb](http://www.lsu.edu/irb)

I certify my responses are accurate and complete. If the project scope or design is later changed, I will request for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Approval: \_\_\_\_\_  
 Signed Consent Waiver: \_\_\_\_\_  
 Registrar: \_\_\_\_\_

## **VITA**

Meredith T. Harris is a native of Sulphur, Louisiana. She graduated from Louisiana Tech University with a Bachelor of Arts degree in psychology in 2012 and enrolled in Louisiana State University's school psychology doctoral program following graduation. Her research interests include internalizing disorders, as well as academic and behavioral interventions conducted in schools. Meredith is currently conducting her graduate work under the supervision of Dr. George H. Noell.